



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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TC 1700

APPLICANTS: Aalbertus Pieter Kroesbergen et al.  
Application NO.: 09/455,574  
FILED: 12 June, 1999  
FOR: SUBSTRATE WITH SUPER-ABSORBENT MATERIAL,  
METHOD FOR MANUFACTURE THEREFORE AND USE

**DECLARATION UNDER 37 C.F.R. § 1.132**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

I, Dr. Harald R. Schmidt, hereby declare as follows:

1. I am a citizen of Germany, residing at Hoteser Weg 48 in 47918 Tönisvorst.
2. I studied chemistry at the Universities of Darmstadt, Tübingen and Düsseldorf and received a degree in the field of organic chemistry in the year 1993.
3. Since 1993 I have been employed as a chemist in the field of superabsorbents and I am still working in this field for the company of Stockhausen GmbH & Co. KG, Krefeld, Germany.
4. The following tests were made under my supervision and control:

**I. Additional tests with CP 40 and CP 46 screen according to the US application No. 09/455,574**

In addition to the earlier tests that were carried out with a CP 30 screen having a mesh width of 745  $\mu\text{m}$ , two more experiments using a CP 40 screen (mesh width  $\sim 550 \mu\text{m}$ ) and a CP 46 screen (mesh width 345  $\mu\text{m}$ ) were performed.

The super-absorbent composition according to the US application No. 09/455,574 was prepared from two components. Component 1 consists of an aqueous solution of a pre-cross-linked polyacrylic acid, which was partially present in the form of its sodium salt.

Shortly before application to the substrate, component 2, ethylene glycol diglycidylether, in a quantity of 3% by weight, related to the total quantity of component 1, was added to component 1 and mixed homogeneously therewith for 10 minutes.

The mixture was applied to a polyester fabric by means of screen printing technique with a screen having a mesh width of

- a)  $\sim 550 \mu\text{m}$  (CP 40 screen)
- b)  $355 \mu\text{m}$  (CP 46 screen).

After printing, the substrate with the mixture thereon was dried at 190 °C for 3 minutes in order to cause the cross-linking process to take place.

The thus obtained products had a swelling height of

- a) 0,44 mm (CP 40)
- b) 0,60 mm (CP 46)

at an application of 6  $\text{g/m}^2$  (dry) determined according to the below described method.

**II. Measurement of swelling height**

In order to measure the swelling height, a circular cut-out ( $50.9 \text{ cm}^2$ ) of the coated sheet material is placed in a plastic cup having an inner diameter of 80.5 mm and a height of 30 mm. A thin polyester nonwoven (thickness 0.05 mm) and then a circular punch having a diameter of 80 mm and a weight of 100 g are placed on this nonwoven. The punch is provided with 60 through bores each having a diameter of 2 mm. The height of the punch's upper edge is observed during measuring. 75 ml of deionized water is filled into the cup and the rise of the punch's upper edge is noted after 1 minute (double determination).

All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true, and further, these statements were made with the knowledge that willful false statements and the like, so made, are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the patent application or any patent issued thereon.

November 24, 2003  
(Date)

Harald R. Schmidt  
(Dr. Harald R. Schmidt)



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4. The following tests were made under my supervision and control:

**I. Test according to the US application No. 09/455,574**

**Example 1**

The super-absorbent composition according to the US application No. 09/455,574 was prepared from two components. Component 1 consists of an aqueous solution of a pre-cross-linked polyacrylic acid, which was partially present in the form of its sodium salt.

Shortly before application to the substrate, component 2, ethylene glycol diglycidylether, in a quantity of 3% by weight, related to the total quantity of component 1, was added to component 1 and mixed homogeneously therewith for 10 minutes.

The mixture was applied to a polyester fabric by means of screen printing technique with a screen having a mesh width of  $745\mu$  in order to obtain a regular pattern of islets with a diameter of about  $250\mu$ . After printing, the substrate with the mixture thereon was dried at  $190^{\circ}\text{C}$  for 3 minutes in order to cause the cross-linking process to take place.

The thus obtained product had a swelling height of 1 mm at an application of  $9\text{ g/m}^2$  (dry) determined according to the below described method.

**II. Tests according to the state of art**

**Ila. Comparison Example 1**

The procedure of Example 1 was repeated with the exception that a full surface coated layer was produced.

The thus obtained product had a swelling height, determined as described below, of 0,20 mm at an application of  $9\text{ g/m}^2$  (dry).

## **IIb. Comparison Example 2**

The procedure of Example 1 was repeated with the exception that a regular pattern of islets with a diameter of about 1300 $\mu$  was produced by using an appropriate screen.

The thus obtained product had a swelling height, determined as described below, of 0,25 mm at an application of 9 g/m<sup>2</sup> (dry).

## **III. Measurement of swelling height**

In order to measure the swelling height, a circular cut-out (50.9 cm<sup>2</sup>) of the coated sheet material is placed in a plastic cup having an inner diameter of 80.5 mm and a height of 30 mm. A thin polyester nonwoven (thickness 0.05 mm) and then a circular punch having a diameter of 80 mm and a weight of 100 g are placed on this nonwoven. The punch is provided with 60 through bores each having a diameter of 2 mm. The height of the punch's upper edge is observed during measuring. 75 ml of deionized water is filled into the cup and the rise of the punch's upper edge is noted after 1 minute (double determination).

## **IV. Results**

The absorbent capacity of the substrate provided with super-absorbent material can be determined by measuring of its swelling height, an important property in the case the products according to the US patent application No. 09/455,574 are used as sheating material for cables. From the comparison of the swelling heights one can realize that the substrates provided with super-absorbent material in form of islets having a diameter < 1000 $\mu$  according to US patent application No. 09/455,574 have a surprisingly better absorbent capacity (swelling height) than the substrates provided with super-absorbent material in

form of a full surface coated layer (comparison example 1) or in form of dots having a diameter  $> 1000\mu$  (comparison example 2).

All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true, and further, these statements were made with the knowledge that willful false statements and the like, so made, are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the patent application or any patent issued thereon.

January 10, 2003  
(Date)

Harald R. Schmidt  
(Dr. Harald R. Schmidt)